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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/718,208	11/20/2003	Purnima Naganathan	STL11482	9801

7590 03/30/2007

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EXAMINER	
ABRAHAM, ESAW T	
ART UNIT	PAPER NUMBER
2133	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/30/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/718,208	NAGANATHAN ET AL.	
	Examiner	Art Unit	
	Esaw T. Abraham	2133	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *20 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

GUY LAMARRE
PRIMARY EXAMINER

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/20/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims **1-21** are presented for examination.

Oath Declaration

2. The oath/declaration filed on 11/20/03 is acceptable.

Drawings

3. The formal drawings filed on 11/20/03 are accepted.

Information Disclosure Statement

4. The references listed in the information disclosure statement submitted on 11/20/03 have been considered by the examiner (see attached PTO-1449).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere* CO., 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims **1-21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Li, Jifeng (U.S. PN: 6,560,748) in view of Ariel et al. "hereinafter as Ariel" (U.S. PUBN: 2000/0108090).

As per claims 1 and 10:

Li in figure 6 teaches or discloses a source data u provided for a plurality of interleavers 103-1 through 103-m. The interleavers 103-1 through 103-m (plurality of interleavers) temporarily store the source data u in N bits each, and then reads and outputs the stored source data u in an order different from the input order. Thus, the source data u is randomized by the interleavers 103-1 through 103-m, respectively. Furthermore, in FIG. 7 Li shows the operation of a plurality of interleavers. In this example, two interleavers are connected in parallel. The source data u is provided for each interleaver. Each interleaver changes the order of the data elements forming the source data u according to the predetermined algorithm. The algorithms performed by respective interleavers are different from one another. In the above-mentioned operations, different data sequences are generated by the interleavers. Furthermore, a multiplexing unit 104 (a combiner) multiplexes the output of the interleavers 103-1 through 103-m. That is, the multiplexing unit 104 sequentially multiplexes the data sequence u1 through data sequence um, which are the outputs of the interleavers 103-1 through 103-m, as shown in FIG. 8A (see col. 8, lines 8-63).

Li does not explicitly teach wherein at least two of the plurality of interleavers are of a different type of interleavers.

Li does, however, teach the plurality of inteleavers combined and multiplexed.

Ariel teaches that different message lengths or different types of interleavers can be used to vary a particular message structure and variable properties can be combined; for example, different types of interleavers may also use various message lengths (see page 1, paragraph 0009).

Therefore, it would have been obvious to a person having an ordinary skill in the art at the time the invention was made to implement the system of Li including using different types of inteleavers combined and outputting interleaved sequences as taught by Ariel.

This modification would have been obvious because a person having ordinary skill in the art would have been motivated in order to provide higher coding gains and efficient operation.

As per claim 2:

Ariel teaches that different message lengths or different types of interleavers can be used to vary a particular message structure and variable properties can be combined; for example, different types of interleavers may also use various message lengths (see page 1, paragraph 0009).

As per claims 3-7:

Li in figure 6 teaches a multiplexing unit 104 (a combiner) multiplexes the output of the interleavers 103-1 through 103-m. That is, the multiplexing unit 104 sequentially multiplexes the data sequence u1 through data sequence um, which are the outputs of the interleavers 103-1 through 103-m.

As per claim 8:

Li in figure 4 shows the configuration of the mobile communications system to which the encoding device (see col. 4, lines 35-45).

As per claim 9:

Li in figure 6 teaches a multiplexing unit 104 (a selector) multiplexes the output of the interleavers 103-1 through 103-m. That is, the multiplexing unit 104 sequentially multiplexes the data sequence u1 through data sequence um, which are the outputs of the interleavers 103-1 through 103-m.

As per claim 10:

Li in figure 6 teaches or discloses a source data u provided for a plurality of interleavers 103-1 through 103-m. The interleavers 103-1 through 103-m (pool of interleavers) temporarily store (buffering) the source data u in N bits each, and then reads and outputs the stored source data u in an order different from the input order. Thus, the source data u is randomized by the interleavers 103-1 through 103-m, respectively. Furthermore, in FIG. 7 Li shows the operation of a plurality of interleavers. In this example, two interleavers are connected in parallel. The source data u is provided for each interleaver. Each interleaver changes the order of the data elements forming the source data u according to the predetermined algorithm. The algorithms performed by respective interleavers are different from one another. In the above-mentioned operations, different data sequences are generated by the interleavers. Furthermore, a multiplexing unit 104 (a combiner) multiplexes the output of the interleavers 103-1 through 103-m. That is, the multiplexing unit 104 sequentially

multiplexes the data sequence u1 through data sequence um, which are the outputs of the interleavers 103-1 through 103-m, as shown in FIG. 8A (see col. 8, lines 8-63).

Li does not explicitly teach wherein at least two of the plurality of interleavers are of a different type of interleavers.

Li does, however, teach the plurality of inteleavers combined and multiplexed.

Ariel teaches that different message lengths or different types of interleavers can be used to vary a particular message structure and variable properties can be combined; for example, different types of interleavers may also use various message lengths (see page 1, paragraph 0009).

Therefore, it would have been obvious to a person having an ordinary skill in the art at the time the invention was made to implement the system of Li including using different types of inteleavers combined and outputting interleaved sequences as taught by Ariel.

This modification would have been obvious because a person having ordinary skill in the art would have been motivated in order to provide higher coding gains and efficient operation.

As per claim 11:

Ariel teaches that different message lengths or different types of interleavers can be used to vary a particular message structure and variable properties can be combined; for example, different types of interleavers may also use various message lengths (see page 1, paragraph 0009).

As per claims 12-15:

Li in figure 6 teaches a multiplexing unit 104 (a combiner) multiplexes the output of the interleavers 103-1 through 103-m. That is, the multiplexing unit 104 sequentially multiplexes the data sequence u1 through data sequence um, which are the outputs of the interleavers 103-1 through 103-m.

As per claim 16:

Li in figure 4 shows the configuration of the mobile communications system to which the encoding device (see col. 4, lines 35-45).

As per claim 17:

Li in figure 6 teaches a multiplexing unit 104 (a selector) multiplexes the output of the interleavers 103-1 through 103-m. That is, the multiplexing unit 104 sequentially multiplexes the data sequence u1 through data sequence um, which are the outputs of the interleavers 103-1 through 103-m.

As per claims 18-21:

Li in figure 6 teaches or discloses a source data u provided for a plurality of interleavers 103-1 through 103-m. The interleavers 103-1 through 103-m (subset of interleavers) temporarily store the source data u in N bits each, and then reads and outputs the stored source data u in an order different from the input order. Thus, the source data u is randomized by the interleavers 103-1 through 103-m, respectively. Furthermore, in FIG. 7 Li shows the operation of a plurality of interleavers. In this example, two interleavers are connected in parallel. The source data u is provided for each interleaver. Each interleaver changes the order of the data elements forming the source data u according to the predetermined algorithm. The algorithms performed by

respective interleavers are different from one another. In the above-mentioned operations, different data sequences are generated by the interleavers. Furthermore, a multiplexing unit 104 (a combiner) multiplexes the output of the interleavers 103-1 through 103-m. That is, the multiplexing unit 104 sequentially multiplexes the data sequence u1 through data sequence um, which are the outputs of the interleavers 103-1 through 103-m, as shown in FIG. 8A (see col. 8, lines 8-63).

Li does not explicitly teach wherein at least two of the plurality of interleavers are of a different type of interleavers.

Li does, however, teach the plurality of inteleavers combined and multiplexed.

Ariel teaches that different message lengths or different types of interleavers can be used to vary a particular message structure and variable properties can be combined; for example, different types of interleavers may also use various message lengths (see page 1, paragraph 0009).

Therefore, it would have been obvious to a person having an ordinary skill in the art at the time the invention was made to implement the system of Li including using different types of inteleavers combined and outputting interleaved sequences as taught by Ariel.

This modification would have been obvious because a person having ordinary skill in the art would have been motivated in order to provide higher coding gains and efficient operation.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US PN: 6,571,369	Li Jifeng
US PN: 6,697,990	El-Gamal et al.
US PN: 7,158,589	Cameron at al.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Esaw Abraham whose telephone number is (571) 272-3812. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are successful, the examiner's supervisor, Albert DeCady can be reached on (571) 272-3819. The fax phone numbers for the organization where this application or proceeding is assigned are (571) 273-8300 for regular communications and (571) 273-8300 for after final communications.

Information regarding the status of an Application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or PUBLIC PAIR. Status information for unpublished applications is available through Private Pair only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Esaw Abraham

Art unit: 2133